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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,553	12/14/2001	Masud Jenabi	46417.001012	6016

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EXAMINER

ISSING, GREGORY C

ART UNIT	PAPER NUMBER
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3662

DATE MAILED: 05/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/014,553

Applicant(s)

JENABI, MASUD

Examiner

Gregory C. Issing

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-32 and 34-38 is/are pending in the application.
- 4a) Of the above claim(s) 12-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 22-32 and 34-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. Claims 12-21 are withdrawn from consideration as being directed to a non-elected invention.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-10, 22-32 and 34-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification is insufficiently disclosed as to how the attenuator controls the scan angle and linear polarization of claim 1 and the linear polarization of claims 22 and 30. In paragraph [0033] the use of the attenuators is disclosed "to swamp-out impedance variations to attain the desired impedance matching." While paragraph [0037] describes (1) that the combination of amplifiers, attenuators, phase shifters and the Lange coupler converts the signal to linearly polarized signals and (2) that the scan angle and linear polarization angle of the RFO and RFL output signals from the Lange coupler are determined by the various control signals generated by the SPC, which are used to control of the phase shifters and the attenuators, the specification fails to sufficiently disclose to a skilled artisan how the attenuator controls the scan angle and/or the linear polarization. Applicant is required to show from the original specification how the attenuator provides each of the scanning control and linear polarization control. The specification distinguishes between the attenuator and amplifiers of the unit.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-10, 22-32 and 34-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear how the attenuator controls the scan angle and the linear polarization particularly since its use is defined differently in paragraph [0033].

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-10, 22-32 and 34-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Mohuchy.

Mohuchy discloses the claimed transmitter chip for use in a complex multi-elements phased array antenna system, see Figure 2a, including a gallium arsenide substrate (col. 4, lines 50-52) having disposed thereon a plurality of phase shifters 222, 223, 444 and 555, amplifiers 333 and 666 which control the amplitude level of the RF signals, and a serial t parallel controller 777 which is operative to provide the control signals to the various components and thus control the polarization of the RF signal.

8. The applicant argues that the use of the attenuator enables more precise control of the linear polarization and specifies page 10, line 18 through page 11, line 3, however, the attenuator is specifically described as providing a different feature. The control of the attenuator 304 to control the linear polarization much less the linear polarization and the scan angle is not

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sufficiently described. The applicant clearly distinguishes between the attenuators and the amplifiers in the specification and although both may control the amplitude level of the RF signal, they are different according to the specification. It is not clear how the attenuators and not the amplifiers are in actuality providing the said control, particularly in light of the applicant's disclosure that specifies the use of the attenuator for impedance matching. Even so, the prior art to Mohuchy discloses the claimed use of phase shifters and amplitude control on a GaAs substrate to control the phase shift and amplitude of the RF signal used in an phased array antenna having polarization control.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-10, 22-32 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fassett et al in view of Jacomb-Hood and Nathanson.

Fassett et al teach the subject matter substantially as claimed including a phase shifter and polarization switch for use in forming and steering radio frequency energy, see Figure 1 showing the antenna array having a beam steering computer controlling the phase shifter/polarization switch, Figure 4 showing the phase shifter/polarization switch, and Figures 2, 2A and 3 showing stripline construction. Fassett et al differ from the claimed subject matter since the attenuator is not shown and since the substrate is not shown as gallium arsenide. Jacomb-Hood teaches an adjustable matching network for use in a steerable antenna wherein the matching network may

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be serially inserted between the transmitter and the antenna element so as to reduce the mismatch resulting from electronic scanning. The reduction of mismatch minimizes attenuation loss and absorbs minimum dc power. It would have been obvious to one having ordinary skill in the art the time the invention was made to modify Fassett et al by incorporating the switchable matching network of Jacom-Hood in the electronically-controlled, phase-shifter/polarization switch so as to minimize the mismatch resulting from complex rotation and electronic scanning. Nathanson et al (4,823,136) disclose a T/R chip comprising a series of a digital phase shifter and plural analog phase shifters and an attenuator mounted on a GaAs chip for use in controlling a phased array antenna including scan control. Moreover, the conventional design of a phased array antenna incorporates amplitude as well as phase control; thus, the control of the amplifiers as well as the attenuator would have been obvious to the skilled artisan as shown by Nathanson et al. Additionally, it would have been obvious to a skilled artisan to increase the phase resolution at the expense of a greater cost by providing additional bits of resolution, each of which is half of the preceding.

11. Claims 1-10, 22-32 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caille in view of Fassett et al and applicant's admission of prior art.

Caille discloses embodiments in the telecommunications field wherein steerable beams that are polarized are used to enable frequency reuse resulting in increased communication capacity. Conventional designs incorporate T/R modules using MMIC technology. The T/R modules enable control of the phase shifters for electronic scanning, control of the phase shifters and attenuators for shaping, and control of the phase shifters for polarization control to effect linear, circular or elliptical polarization. Fassett et al teach a conventional phase

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shifter/polarization switch having multiple bits of resolution. It would have been obvious to one having ordinary skill in the art the time the invention was made to modify Caille by incorporating the teachings of Fassett et al by utilizing multiple bits of phase shifters to effectively control the phase shift and polarization control. Caille clearly teaches the control of the phase shifters and amplitude levels to effect control of both scanning and polarization as well as the capability of providing any of numerous types of polarization including linear, circular and elliptical. The implementation technology is taught to be varied based on various preferences to size, costs and accuracy. The use of gallium arsenide in manufacturing is deemed to be conventional in the art as taught by the applicants disclosure [0004] and thus would have been an obvious design choice in the manufacturing process.

12. Claims 1-10, 22-32 and 34-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raby et al in view of Mohuchy.

Raby et al (cited by the applicant in IDS and referred to in the specification) teach a transmit phased array antenna comprising GaAs chips containing phase shifters and amplifiers controlled by a serial to parallel controller as disclosed in the applicant's specification. Raby et al differ from the claimed subject matter, as noted by the applicant, since Raby et al only transmits one linearly polarized signal. Mohuchy teaches the conventionality of a chip design having the capability of controlling the amplitude and phase characteristics of an RF signal so as to vary the polarization of the RF signal. It would have been obvious to the skilled artisan to modify Raby et al by incorporating the teachings of Mohuchy by providing control of the polarization of the RF signal so as to maximize signal capacity in telecommunications or signal to noise ration in radar or telecommunications.

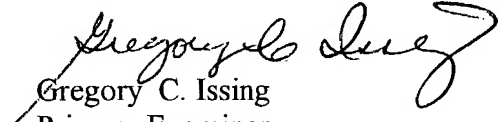
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13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gould (5,568,158) discloses an antenna system having polarization control for effecting horizontal and vertical linear polarization as well as right-hand and left-hand circular polarization wherein the control is provided by controlling the phase shifters and attenuators/variable gain so as to maximize the attainable signal to noise ratio.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory C. Issing whose telephone number is (703)-306-4156. The examiner can normally be reached on Mon-Thurs 6:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on (703)-306-4171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gregory C. Issing
Primary Examiner
Art Unit 3662

gci